

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of) **MAIL STOP: AF**
Hisashi KIZUKA et al.) Group Art Unit: 1796
Application No.: 10/588,998) Examiner: Gregory Listvoyb
Filed: August 10, 2006) Confirmation No.: 4614
For: CROSSLINKED POLYIMIDE)
COMPOUND AND USE THEREOF)

REQUEST FOR PRE-APPEAL BRIEF CONFERENCE

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

A Pre-Appeal Brief Conference is requested to review the above-identified patent application. No amendments are being filed with this request. For at least the following reasons, it is believed that the single prior art rejection of record is improper and without basis.

Overview

Claims 1, 3-5, 12-16, 18, 19, 21-23 and 25 are currently pending in the present application based on the Examiner's entry of the Amendment filed on February 10, 2009. All of the claims have been rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over the combination of Lepage, U.S. Patent No. 5,824,765, and Harada et al., U.S. Patent No. 5,686,066, for the reasons provided in the final Official Action dated November 12, 2008, and the Advisory Action dated March 13, 2009.

The Claimed Subject Matter

Claim 1 is the sole independent claim in the present application and provides a polyimide compound crosslinked with polyamine which is soluble in a solvent containing aprotic polar organic solvent, wherein the polyimide compound is obtained by dehydration and condensation of amino acid or salt thereof in the presence of polyamine and protonic acid in the solvent containing aprotic polar organic solvent and 0.05 to 10 mol% of said polyamine is used with respect to the

amount of the amino acid or salt thereof, and wherein a concentration of the obtained polyimide compound in the reaction mixture is 5 to 80% by weight and wherein the polyimide compound is soluble in the solvent containing the aprotic polar organic solvent in a concentration of 5% by mass or more at 25°C.

It is important to keep in mind that the polyimide compound is crosslinked with the polyamine and yet is still soluble to the defined extent in the aprotic polar organic solvent. This makes the crosslinked polyimide compound very useful in the cosmetics field. In order to achieve these advantageous results, the polyimide compound is obtained by dehydration and condensation of amino acid or salt thereof in the presence of the polyamine and the protonic acid in the solvent containing aprotic polar organic solvent. Furthermore, the amount of polyamine and the concentration of the obtained polyimide compound in the reaction mixture are both defined.

The Examples starting on page 18 of the specification illustrated that when following the teachings of the present invention, a crosslinked high molecular weight polyimide can be obtained that is still soluble in the illustrative solvent containing the aprotic polar organic solvent (as can be understood from the description of the polymer solution being passed through the filter paper). The Comparative Examples show that when the present invention is not followed, inferior results are obtained. For instance, as shown in Comparative Examples 1 and 2, when the polyamine or the protonic acid is omitted, a low molecular weight polymer is obtained. On the other hand, Comparative Example 4 shows that when the polyamine is used in an amount greater than that recited in claim 1, gelling occurs and the claimed solubility could not be achieved. Thus, it can be understood that the conditions recited in claim 1 have an effect on the final product.

Argument

Contrary to the position by the Examiner, Lepage does not provide a polyimide compound that is crosslinked with a polyamine and clearly does not provide the crosslinked polyimide by dehydration and condensation of amino acid or salt thereof in the presence of polyamine and protonic acid in the solvent containing aprotic polar organic solvent and the defined amount of polyamine so that the concentration of the obtained polyimide compound in the reaction mixture is 5 to 80% by weight and the polyimide compound has the defined solubility in the solvent containing the aprotic polar organic solvent.

Instead, Lepage relates to the preparation of polycondensates of amino acids or of polypeptide hydrolysates thereof. The patent is simply not seeking a polyimide compound that is crosslinked with a polyamine. In fact, the term "crosslinked" is not found anywhere in the patent. The Examiner's reference to the paragraph beginning at column 2, line 35 is totally misplaced. This paragraph merely indicates that mixtures of amino acids can be used as is evident from the following reproduction of the paragraph:

Among the amino acids which may be used to perform the process of the invention, there may be mentioned aspartic acid or glutamic acid, taken alone or mixed together in any proportion or mixed with another amino acid (for example up to 15% by weight, preferably less than 5% by weight, of glycine, alanine, valine, leucine, isoleucine, phenylalanine, methionine, histidine, proline, lysine, serine, threonine, cysteine, etc.). The preferred amino acid is aspartic acid.

The Examiner has focused on the description of lysine in this passage, which is indeed one of the polyamines that can be used in the present invention. However, it is the **only** amino acid of the disclosed group that meets the polyamine crosslinking agent of the present invention. Furthermore, there is not a single Example in Lepage which uses **any** mixture of amino acids, much less the single lysine species relied on by the Examiner.

Lepage is further deficient by failing to teach the claimed amount of polyamine which achieves crosslinking, but which avoids gelation as can be understood by the recitation of the solubility of the polyimide compound in solvent containing the aprotic polar organic solvent and aforementioned Comparative Example 4.

Lepage also does not use a dehydration and condensation technique in the presence of the polyamine and protonic acid in the solvent containing aprotic polar organic solvent. Instead, the patent requires a process that involves bulk thermal polycondensation of amino acids in a pulverulent medium in the presence of phosphoric acid, phosphorous pentoxide or polyphosphoric acid catalyst which is uniformly distributed in the pulverulent medium. Thus, in contrast to the defined solvent system which results in a crosslinked polyimide with the defined level of solubility, the patent requires a pulverulent system as demonstrated by the opening line of each of Examples 1-8 which reads: "A **pulverulent** mixture is prepared by:" (emphasis added). Furthermore, it will be noted that Comparative Examples 9 and

10 of Lepage do not use a pulverulent mixture and report inferior results compared to the illustrative examples.

In view of the foregoing discussion, it is without doubt that Lepage does not meet the recitation in claim 1 that the polyimide compound is obtained by dehydration and condensation of amino acid or salt thereof in the presence of polyamine and protonic acid in the solvent containing aprotic polar organic solvent. In this latter respect, the Examiner's reference to an aprotic polar organic solvent on page 2 of the Action, is inapposite. This passage of the patent only refers to the purification of the formed polyimide which is apparent from the passage at column 3, lines 21-31 which reads:

The polyimide obtained according to the process of the invention may, if necessary, be separated out, filtered off, purified and dried.

The catalyst may, if desired, be separated from the polyimide by washing with water or using a solvent for the catalyst which is a non-solvent for the polyimide.

The polyimide may be purified by solubilization using a polar aprotic solvent (dimethylformamide, formamide, dimethyl sulphoxide, etc.) followed by reprecipitation using a non-solvent compound for the said polyimide (water, ether, ethanol, acetone, etc.).

By requiring a pulverulent mixture, Lepage would actually lead away from the recitations in the claims that the polyimide compound is obtained by dehydration and condensation of amino acid or salt thereof in the presence of polyamine and protonic acid in the solvent containing aprotic polar organic solvent. Moreover, if one were to attempt to crosslink in the required pulverulent mixture, one would likely have a higher degree of crosslinking due to the higher concentration of amino acid which would result in a polysuccinimide that would not meet the solubility recited in claim 1.

Harada et al. has been cited to show that an aprotic solvent, such as dimethylformamide, is a good solvent for polysuccinimide. This disclosure does not add anything to the aforementioned description in Lepage that the formed polyimide can be purified by solubilization in a polar aprotic solvent. The Examiner' statement on page 3 of the Action dated November 12, 2008, that based on this description one would be led to using such a solvent in the polycondensation reaction is not based on the actual teachings of the patents, but rather on a hindsight justification based solely on applicants' own teachings which of course is improper.

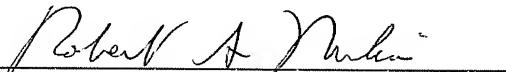
Furthermore, such a hypothetical combination would not be proper since it would be directly contrary to the requirement of Lepage to use a pulverulent medium.

As a still further reason why the claims are patentable over the combination with Harada et al. is the fact that the patent would actually lead those of ordinary skill in the art away from the present invention by teaching in the passage beginning at column 13, line 9, that the polysuccinimide can be reacted with at least one diamine compound or amphoteric amine compound which is different from the claimed polyimide which is prepared in the presence of the polyamine so as to obtain a crosslinked polyimide that is still soluble in the solvent containing the aprotic polar organic solvent as recited in claim 1. Thus, the additional reliance on Harada et al. would not lead those of ordinary skill in the art to the presently claimed invention and, if anything, would lead away from the present invention.

For all of the reasons set forth above, applicants respectfully submit that the claims of record are patentable over the cited prior art and therefore request allowance of the present application.

Respectfully submitted,

BUCHANAN INGERSOLL & ROONEY PC

By: 
Robert G. Mukai
Registration No. 28531

P.O. Box 1404
Alexandria, VA 22313-1404
703 836 6620

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